

**THE ROLE OF COMMUNITY PARTICIPATION
IN THE PREVENTION OF DENGUE:
A CASE STUDY FROM CUBA**

by

Rosamelia Andrade

Diploma in Latin American Management, Capilano College 2003
Bachelor of Arts, Universidad San Francisco de Quito 1997

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APPROVAL

Name: **Rosamelia Andrade**

Degree: **Master of Arts in International Leadership**

Title of Project: **The Role of Community Participation in the
Prevention of Dengue: A Case Study from Cuba**

Supervisory Committee:

Dr Stephen Easton
Professor
Department of Economics
Senior Supervisor

Dr John Harriss
Professor and Director
School of International Studies
Supervisor

Date Approved:

April 11, 2007



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ABSTRACT

More than 2.5 billion people in the world remain potentially exposed to acquire dengue fever in their lifetimes. Climate change, uncontrolled urbanization, poverty and environmental degradation have contributed to the increase of the *Aedes aegypti* population, the main vector that carries the disease. Traditional eradication programs that focused on mosquito larval control with the use of chemicals failed to eliminate the disease. Evidence shows that the involvement of the community in reducing the breeding sites of *Aedes aegypti* and collaboration among various sectors of the community are the most effective methods to prevent dengue. This paper explores the role of community participation in the prevention of dengue fever and the control of its main vector. Using a community-based intersectoral program in a district of Havana, Cuba, this study analyzes the efficiency of such a participatory approach and its capacity to be a sustainable solution for dengue prevention.

Keywords: dengue; community capacity and participation; public health system; intersectoral collaboration; Cuba

Subject Terms: health promotion; community organization; citizen participation; public health; communication in development; social change

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1. INTRODUCTION

Dengue fever, a vector-borne infectious disease, affects nearly 100 million people every year. Despite the advances in science and the efforts undertaken to eradicate the disease, an inoculation against dengue fever has not yet been found. Evidence shows that traditional dengue control programs that focused on eliminating *Aedes aegypti* larval through chemical spraying in houses where the vector was found were able to control dengue fever temporarily, but failed to achieve long-lasting results.

Research shows that the method that has been most effective in preventing the proliferation of the illness is controlling the breeding sites of the mosquito that carries the disease. Therefore, the participation of people who are affected by the disease is crucial in finding effective solutions such as improving their own environmental and hygienic conditions and changing harmful behaviours that led to the propagation of mosquito breeding sites.

The purpose of this paper is to identify the role of community participation in the success of preventive programs that aim to control the proliferation of the mosquito *Aedes aegypti* and the spread of dengue. Using a case study of a community-based dengue prevention program developed in a municipality of Havana, Cuba and following participatory frameworks found in the literature, I will analyze Cuba's participatory approaches that have helped build community capacity to prevent the reproduction of the mosquito and the spread of the disease. The goal is to determine whether community

participation has contributed positively to the control of mosquito breeding sites and the prevention of dengue.

Cuba presents good examples of how community participation in dengue prevention programs has led to communities having both increased knowledge about the disease and behavioural changes to reduce *Aedes aegypti* breeding sites. Cuba's unique social organization and political structure provide the space for participation to occur in almost every aspect of human life including health.

The integrated healthcare system in Cuba has fostered intersectoral collaboration, which encourages community health partnerships by combining efforts and participation of different sectors of society such as local governments, environmental and health institutions and the community to achieve common goals. An intersectoral approach is important to help promote capacity building not only at the local government level, but also at the community level and to use limited resources more efficiently.

Studies carried out by Gubler and Clark (1994; 1996), Lloyd (2003), Rigau-Perez et al. (1998), Rosenbaum et al. (1995), suggest that best results are achieved when a community's priorities and knowledge are taken into account by the national or regional dengue prevention authorities, and when initiatives are built on assets that already exist in the community. Evidence indicates that positive outcomes result from involving the community right from the planning stages of a dengue prevention intervention and when people are active participants during the implementation and the evaluation phases.

Following Pretty (1995)'s participatory typology, I have analyzed a community-based intersectoral initiative for the control and prevention of dengue in a district of Havana City that took place from September 1999 to August 2000 (Sanchez et al. 2004; 2005). This study documented the community's understanding of participation in dengue prevention and the results were applied to participatory strategies to control *Aedes aegypti* breeding sites in the same district.

This case study reported a direct relation between increased knowledge about dengue and a reduced number of breeding sites and containers infested with *Aedes aegypti* in households where the intervention took place. It was found that individual behavioural change was prompted by collective actions in the neighbourhoods such as clean up of common spaces, participation in community meetings and debates, more reliable waste collection and housing improvements.

Even though the case study revealed a great degree of participation at the community level, the analysis also showed that participation came about as a contribution to initiatives that were started by the government and health authorities and not by the community itself. In addition, the evaluation of results was conducted after one year of the intervention and no further evaluation has taken place in the years that followed. The community's knowledge, attitudes and practices towards dengue and its vector beyond the intervention period have been difficult to assess and therefore the long-term sustainability of this participatory approach is uncertain.

However, community-based intersectoral participatory programs to control dengue have been replicated in different communities in Cuba with successful results. After the 2001-2002 dengue epidemic that affected specific municipalities of Havana, no

outburst of dengue was found beyond the boundaries of the city and no other cases have been reported since then.

This paper concludes that there are still important gaps in terms of the effectiveness of community participation in the control of mosquito breeding sites and prevention of dengue and the sustainability of the approach. Additional evaluation is needed to assess a community's perception and understanding of participation and the role of the members of the community in the control and prevention of dengue and its vector in the long term.

2. DENGUE: AN EMERGENT GLOBAL ISSUE

Dengue is one of the major arboviral¹ vector-borne diseases affecting humans today and it is the one that is most prevalent in the Latin American-Caribbean region. It is estimated that vector-borne diseases account for approximately 17% of the global burden of infectious illnesses (Townson et al., 2005, p. 942).

The female mosquito *Aedes aegypti* is the most common of its species that produces dengue fever and dengue hemorrhagic fever. The mosquito is considered an urban, day-biting, domestic insect of the tropics and subtropics that has adapted to poor environmental conditions especially in developing countries.

Due to climate change, deterioration of the environment, rapid and uncontrolled urbanization and poverty (Spiegel, Bonet, Ibarra, Pagliccia, Ouellette, & Yassi, in press), it is predicted that more than 2.5 billion people in more than 100 countries are at risk of acquiring dengue fever (Guzman & Kouri, 2002, p. 33). It is estimated that between 50 to 100 million cases of dengue occurred every year, but not all of them are reported or treated by medical staff (Dee et al., 2006, p. 170). Of the ones that are reported, a third is

¹ Arboviral is short for *arthropod-borne virus*, the viruses transmitted by arthropods such as mosquitoes and parasites. The arthropods hold the viruses and transmit them to vertebrate hosts through bites leaving infections and pathogens that produce hundreds of diseases, being malaria, dengue, encephalitis, yellow fever, leishmaniasis and chagas some of the most common ones (Answers.com, n.d.).

diagnosed as dengue hemorrhagic fever, a very severe case of dengue which in most cases is fatal producing 25 thousand deaths annually² (Spiegel et al., in press).

Because tropical climates are ideal for the proliferation of the mosquito, dengue affects mostly the developing world. Governments in developed countries have not seen the disease as an international threat. However, recent studies suggest that an epidemic outbreak could take place in regions that historically have not been considered at risk. International travel and trade, for example, may facilitate the transmission of dengue in regions where the disease was once eradicated as well as introduce the illness to new regions that may have never had a dengue outbreak. It is suspected that between 100 and 200 cases of dengue are brought into the US each year by travelers (CDC, 2003).

Evidence shows that the risk of a dengue pandemic has increased considerably in the past 20 years. The appearance of dengue hemorrhagic fever has been related to the introduction of serotypes³ to parts of the world where they did not exist previously (Rigau-Perez, Clark, Gubler, Reiter, Sanders, & Vorndam, 1998, p. 971). It has been reported that dengue hemorrhagic fever frequently happens in countries that previously reported only cases of dengue fever (WHO, 1997, p. 37). Despite the international efforts to eradicate the disease, the repeated and stronger outbreaks of dengue fever and dengue

² Dengue fever symptoms are characterized by sudden fever with or without rash, severe headaches, muscle and joint pain, retro-orbital pain and debilitation of immune system. It is an incapacitating disease but the likelihood of recovery is high. Dengue hemorrhagic fever presents more serious symptoms; if not treated promptly it could produce shock and internal hemorrhage leading to death. (CDC, 2005a).

³ Serotype is defined as a group of intimately related microorganisms or viruses distinguished by a characteristic set of antigens. Dengue and dengue hemorrhagic fever are caused by one of 4 serotypes: DEN-1; DEN-2; DEN-3 and DEN-4. Infection with one of the four serotypes provides immunity to only that serotype for life, but a person can acquire dengue produced by a different serotype and when this occurs typically the disease is more severe than previous occasions (CDC, 2005b).

hemorrhagic fever in the past two decades have brought dengue into the spotlight again as an emergent global health issue.

2.1 Overview of *Aedes aegypti*

The mosquito *Aedes aegypti* is an arthropod that carries yellow fever and dengue viruses (Severson, Knudson, Soares, & Loftus, 2004, p. 715). It is a domesticated insect that has adapted to urban areas of the tropics and subtropics and has become dependant on humans. Only the female of *Aedes* bites for blood that she uses to nurture her eggs. *Aedes aegypti* is a day-biting mosquito as opposed to the malaria mosquito that prefers feeding during the night (CDC, 2005b).

Dengue infection occurs from human to mosquito to human. The mosquito feeds from an infected human, incubates the virus for a period of 8 to 10 days, carries the disease and infects other humans through its salivary glands while feeding again. Once the mosquito is infected with the dengue virus, it carries the disease for life (Russell & Doggett, n.d.). Even after the elimination of adult mosquitoes through insecticide spraying, the disease may continue because the viruses can be passed from mother to egg. Therefore, larva *Aedes* can be infected with the disease and continue the cycle. Eradication of mosquitoes at the larva stage is preferred.

The ideal breeding area of the mosquito is stagnant water. Open containers that store water, for example water tanks, tires, jars for domestic use, flower vases or disposed items that are filled with rain water, are the best places for the mosquitoes to grow (Koenraadt, Tuiten, Sithiprasasna, Kijchalao, Jones, & Scott, 2006, p. 692). Table 1 shows a list of domestic containers that most commonly hold *Aedes aegypti* larvae,

according to studies conducted in several locations where proliferation of dengue has been high.

Table 1 – Domestic containers that tests positive for *Aedes aegypti* larvae

1	Tires
2	Bottles/jars
3	Cans
4	Flower vases / "spiritual" vases
5	Animal water dishes
6	Metal containers (pots and pans)
7	Plastic containers
8	Buckets
9	Cement washbasins for laundry
10	Ceramic bathroom fixtures outside the home
11	Metal tanks for water storage
12	Barrels
13	Coconut shells
14	Ant traps
15	Uncovered toilet water tanks and bowls

Data Sources: Koenraadt et al., 2006, p. 695; Leontsini, Gil, Kendall, & Clark, 1993, p. 268; Lloyd, Winch, Ortega-Canto, & Kendall, 1992, p. 639; 1994, p. 408; Spiegel et al., in press

Even though the *Aedes aegypti* has been extensively studied by the research community (Severson et al., 2004, p. 715), an effective vaccine has not yet been developed to combat dengue fever and dengue hemorrhagic fever. Experience has taught us that with current technology the most effective solution to prevent the diseases is to reduce the vector population by improving environmental conditions and human behaviours that are favourable for mosquito breeding (Koenraadt et al., 2006, p. 692; Rigau-Perez et al., 1998, p. 975).

Since the first epidemic outbreak of the 20th century that occurred after World War II, many initiatives have taken place in different parts of the world in an effort to eradicate the disease.

2.2 History of the Epidemic

The first cases of dengue were recorded in 1779-1780 in Asia, Africa and North America. This simultaneous incidence suggests that the disease and the vector have been around the tropics and subtropics areas for more than 200 years with intervals of 30 to 40 years between major epidemics (CDC, 2005b). Dengue was seen as a mild and controllable illness, but increasing movement of trade and people between continents enhanced the proliferation of the *Aedes aegypti* (WHO, n.d.).

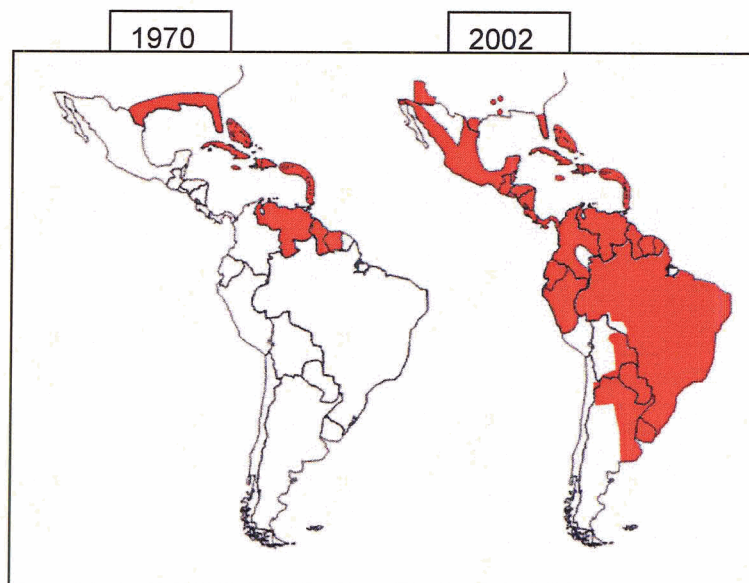
The first pandemic of modern history took place in Southeast Asia after the Second World War and presented not only dengue fever, but also dengue hemorrhagic fever. Some of the main causes for such an increase of the disease are the unplanned urbanization of large cities in the developing world and the lack of infrastructure to provide adequate water supply, waste management and appropriate housing (WHO, n.d.).

In the late 1950s and 1960s, The Pan American Health Organization initiated a hemispheric campaign in the Americas to eradicate urban yellow fever, which is also transmitted by the *Aedes aegypti*. The process of elimination of the mosquito began with very positive results. The countries that were affected by dengue fever –including the United States- appeared to be able to control the presence of the vector, and the disease disappeared (CDC, 2005b). Due to the apparent extinction of the mosquito and eradication of the disease, the dengue prevention programs were discontinued in the 1970s. But as governments in the Americas thought their countries were free of the vector, *Aedes aegypti* re-infested all of the countries from which it once had been eradicated and both the vector and the disease were extended to countries that were not

infected prior to the eradication program (Gubler, 2005, p. 221; Guzman & Kouri, 2002, p. 34).

In the last quarter of the 20th century, the pandemic intensified with a wider geographic spread of the disease as well as the *Aedes aegypti* population (Gubler, 2005, p. 221). Figure 1 illustrates the re-infestation of *Aedes aegypti* in the Americas from 1970 to 2000 showing the geographic spread of the disease to almost all Central and South American countries.

Figure 1 – Distribution of *Aedes aegypti* in the Americas at the end of the mosquito eradication program in 1970 and in 2002



Source: CDC the US Centers for Disease Control and Prevention (CDC, 2005c).

2.3 Challenges of Traditional Dengue Control Programs

The initial programs to control dengue took place from the 1940s to the 1970s. These were promoted by the World Health Organization and implemented by governments of countries around the world. The programs were characterized by their vertical and top-down approach that prevented the involvement of affected people in the

planning, designing and implementation of such programs. These initiatives mainly focused on mosquito larval control through the use of chemicals via massive spraying campaigns (Gubler, 2005, p. 221; Lloyd, 2003, p.3), including the ultra-low volume application of malathion that was intended to eliminate the female adult population of *Aedes aegypti* (Leontsini, Gil, Kendall, & Clark, 1993, p. 267).

Another strategy that was commonly used at this time consisted of periodic visits by vector control field workers to individual houses in neighbourhoods at risk of infestation. The objective of such visits was to spot and eliminate *Aedes aegypti* foci at an early stage. These interventions sometimes occurred three or four times a year, and in some countries lasted for several decades (Lloyd, 2003, p. 3).

The failure of such programs resulted from several important factors. Evidence shows that the mosquito started to become resistant to the chemicals used in the eradication programs. The periodical visits to dengue risk areas required enormous commitment of economic and human resources that governments were unable to sustain (Gubler & Clark, 1994, p. 51). But most of all, it was the lack of community input and participation that provoked community apathy towards dengue control activities (Lloyd, 2003, p. 3), which meant that people chose not to follow instructions.

2.4 New Approaches for Dengue Control and the Role of Community Participation

After the global crisis of the 1980s, governments and international organizations began exploring new approaches to deal effectively with the disease. Because the traditional strategies that sought very little or no community input did not demonstrate long-lasting results, health authorities were encouraged by the World Health

Organization to think about initiatives that incorporated community participation and aimed at controlling the breeding sites of the *Aedes aegypti*.

The initial programs that considered community participation in their approach were not very different from the traditional vertical and top-down ones. Despite seeking cooperation from the community in the implementation of activities, the programs were still centrally planned and lacked active inclusion of members of the community during the planning stages (Gubler & Clark, 1996, p. 171). Furthermore, studies conducted by Rosenbaum et al. (1995, p. 111) showed that programs such as these not only ignored community priorities, but also disregarded the role of family, community and government in maintenance and control of preventive programs.

In some instances, failure of community participation in specific control programs is reflected in the lack of communication and understanding of priorities, objectives and actions. In Mexico it was found that the community perceived prevention very differently from health authorities and program planners. This affected community response to preventive measures (e.g. elimination of containers, proper sealing of water tanks, etc.). For the community, prevention did not mean elimination of mosquito breeding sites but rather caring for people who showed symptoms of dengue fever or who already had dengue fever to avoid spread of the disease to the rest of the community (Gubler & Clark, 1994, p. 56). This example illustrates the importance of learning the priorities of the communities and taking into account their perspectives in order to succeed.

Many initiatives have failed by not using the knowledge that already exists in the community. The analysis of knowledge, attitude and practices and recognizing the needs of a particular community should be the basis for mobilizing the community to take

action against the proliferation of the vector (Gubler & Clark, 1996, p. 177; Rigau-Perez et al., 1998, p. 975).

Research indicates that even when there has been community participation difficulties have emerged when trying to link knowledge to positive behavioural change to prevent breeding sites of *Aedes aegypti*. Studies have found that knowledge and awareness about the vector and the disease does not necessarily translate into improved behaviour, such as the elimination of stagnant water in households at risk of infestation (Gubler & Clark, 1994, p. 52).

Rosenbaum et al. (1995, p. 114) conducted a study in Trinidad and Tobago to measure the relationship between knowledge of dengue and actual practice of eliminating vector foci in households. The study found that awareness levels about dengue and its causes were quite high within the population surveyed, but knowledge of the symptoms and consequences of dengue on human health were low. Therefore, the level of awareness had almost no relationship with the actual practices to prevent the proliferation of *Aedes aegypti* because people did not perceive dengue as a threat to their health. Indeed, it was found that people with higher levels of knowledge about dengue had high numbers of potential or actual mosquito larval sites in their homes. The study concluded that there were shortcomings in the understanding and perceptions of the community in terms of the relationship between dengue, the mosquito and the consequences of the disease. It was recommended to educate and inform the affected population about the consequences of not controlling mosquitoes in their own premises (Ibid, p. 115).

Most importantly, it has been difficult to determine the effectiveness of community-based programs because they have not been evaluated. In the Caribbean, for

example, it is common that programs that have initially showed signs of success ended up being interrupted due to natural disasters and consequent priority shifting. Research demonstrates that any dengue control program should be clear about the intended objectives and such objectives ought to be quantifiable and actually evaluated.

In the study conducted by Gubler and Clark (1996, p. 173), they identified only two programs that had been evaluated, one in Singapore (1968) and one in Cuba (1981). The evaluation of the program in Puerto Rico (1984) was in progress at the time the study was done. The only community-based dengue prevention program that was evaluated and reported positive outcomes was developed in Cuba (Gubler & Clark, 1996, p. 173).

In 1981, Cuba experienced its first nation-wide dengue epidemic many years after having successfully eradicated the disease. This outbreak was particularly important because it presented cases of dengue hemorrhagic fever. Cuba was the first country in the Americas to experience it. The magnitude of the epidemic plus the lack of a vaccination to prevent dengue, prompted Cuban health authorities to implement an intense campaign to eradicate the mosquito and its breeding sites in household environments using an integrated approach that required continuous community participation (Bonet, Spiegel, Ibarra, Kouri, Pintre, & Yassi, in press). Cuba is one of the few countries at risk of contracting dengue that has been able to move beyond crisis management to sustainably prevent the proliferation of *Aedes aegypti*.

Cuba had successfully controlled the propagation of the mosquito from 1981 to 1997. New outbreaks were recorded in 1997 and between 2000 and 2002. During these epidemics alternative strategies were promoted such as intersectoral coordination among different actors and community-based vector control programs in an effort to achieve

sustainable dengue prevention (Gubler, 2005, p. 222; Guzman & Kouri, 2002, p. 40; Sanchez et al., 2005, p. 83). The last dengue outbreak (2000-2002) began and remained in specific municipalities of Havana City and did not reach any other parts of the country.

The Cuban experience of dengue control and prevention provides evidence that community participation could lead to positive results, such as the reduction of mosquito breeding sites. Section Two will review the general concepts of community capacity and participatory approaches for disease control within an intersectoral framework.

3. COMMUNITY CAPACITY: PARTICIPATORY APPROACHES TO HEALTH PROGRAMS

The failure of dengue prevention programs in the 1970s provoked a global outbreak of dengue fever and dengue hemorrhagic fever and encouraged health authorities at all levels to re-think public policy towards vector-borne diseases. This section will elaborate on the concept of community participation that was introduced as an alternative to the traditional vertical and top-down programs that were unsuccessful in preventing *Aedes aegypti* breeding sites and controlling dengue.

The World Health Organization was the leading international institution that fostered the principle of community participation in health programs, focusing on the involvement of people, not only professionals, in decisions about development including health (Rifkin, 1996, p. 79). The concept of community participation came about in the late 1970s in response to criticisms received by the international development sector resulting from its imposed 'recipes for all' that negatively affected thousands of communities around the world (Fraser & Restrepo-Estrada, 1998, p. 47). In 1978, during the Alma-Ata conference, members of the WHO established the goal of "health for all" by the year 2000 and determined the need to clarify community involvement in health development (Ndekha, Hansen, Moldgaard, Woelk, & Furu, 2002, p. 326). Under this new approach, the international health development organizations began to involve

communities in their own socio-economic development using different participatory models (Espino, Koops, & Manderson, 2004, p. 5).

In health programs in particular, the concept of community participation is defined as a process whereby members of the community with shared needs and living in a certain geographic area, actively identify needs, assume increased responsibilities, identify potential solutions to health problems and plan strategies to solve those problems (Butterfoss, 2006, p. 325; Espino et al., 2004, p. 11). Greater acceptability and trust for an external organization's goals are promoted when problems and needs are determined at least in part by the community. This exercise can also provide information about the community that may be unknown to its members, contributing to building community capacity, which is an important aspect of participation (Brieger, 1996, p. 95).

Providing space for a community to address its own concerns as viewed and perceived by the community itself is a very effective way of empowering people (Yassi, Fernandez, Fernandez, Bonet, Tate, & Spiegel, 2003, p. 74). Truthful and meaningful participation can only be achieved when members of the community feel empowered and ready to take action to solve their own problems instead of following instructions that have been imposed on them.

It is important to recognize that there are different types of community participation as well as various degrees of participation, which may affect the outcomes. Pretty (1995, p. 1251) makes a distinction between the many interpretations of the word 'participation' within the development field. He considers there are two important views of participation that differ from each other and that between these two, there are several types and interpretations that range, vary and overlap. The first one examines

participation as a means to increase efficiency because if people are involved they tend to support the initiative.

Rifkin (1996, p. 81) calls this approach a “target-oriented” framework in which decision making is in the hands of professionals and planners and some consultation with the community can take place, but only to ensure more acceptability of the chosen intervention. In this approach, community participation is seen as a component of a health program rather than being the intervention itself (Ibid, p. 82). See Table 2.

Table 2 – Approaches to community participation in health

<p style="text-align: center;">Approach 1 Target-Oriented Framework</p>	<p style="text-align: center;">Approach 2 Empowerment Framework</p>
<ul style="list-style-type: none"> ○ Planners and professionals decide specific objectives of health programs ○ Community is convinced to actively accept these objectives and to agree to a particular health intervention ○ Planners see community participation as providing instructions to people on how to improve their individual or collective health ○ In some cases, planners seek community contribution to the program/intervention beyond mere acceptance ○ Participation is perceived within a context that has already been defined by planners and professionals without community input <p>Example: mass vaccination campaigns</p> <p>Evaluation: product oriented, results quantified and rates measured. Quantitative methodology</p>	<ul style="list-style-type: none"> ○ Communities are encouraged to make decisions about resource allocation and priorities and then ask professionals to respond to these decisions ○ Structural changes at the local level can bring equality and therefore a more fair distribution of resources ○ Community participation in health programs □ a catalyst for social change by empowering local populations to become involved in the political process <p>Evaluation: perception of social change by community members, people's priorities and concerns. Qualitative methodology</p>

Data Source: Rifkin, 1996, p. 81-82

For many years, community participation was considered a passive acceptance of health interventions designed by others outside of the community where they would be implemented (Krogstad & Ruebush, 1996, p. 77). The word participation became widely used in all development projects including health. Pretty (1995, p. 1252) argues that on most occasions, this type of participation was limited to asking people to take part in projects that did not respond to their needs or interests.

This traditional view of participation has been challenged by other schools of thought (Pretty, 1995, p. 1251) that define participation as “a fundamental right, in which the main aim is to initiate mobilization for collective action, empowerment and institution building.” Pretty (1995, p. 1251) argues that if put in practice, this type of participation helps increase ownership of policies and projects and improve community mobilization, transparency and accountability contributing to empowerment and capacity building.

This is what Rifkin (1996, p. 83) considers the “empowerment framework”, which sees community participation as an end in itself, as an essential process that enables local people to have access to resources and make decisions that affect their own lives. Within this framework, local people define their own problems and find solutions that are appropriate for the community and decide on resource allocation accordingly, as a result of active community involvement in all aspects of the process.

In Table 3 Pretty provides an illustrative typology of what he describes as how people participate in development programs. There are seven types of participation that range between passive participation and active community involvement at different stages of the development process. When the term participation is used, Pretty (1995,

p.1253) urges the need to clarify such a term and categorize it in order to achieve better results.

Table 3 – Typology of Participation: how people participate in development projects

Typology	Characteristics
7. Self-mobilization	People participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Self-mobilization can spread if an enabling framework of support is put in place. Such self-initiated mobilization may or may not challenge existing distributions of wealth and power.
6. Interactive participation	People participate in joint analysis, development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals. The process involves interdisciplinary methodologies and structured learning processes. As groups take control over local decisions and determine how resources are allocated, they feel more eager to maintain structures and practices.
5. Functional participation	Participation seen by external agencies as a means to achieve project goals, especially reduced costs. People may participate by forming groups to meet predetermined objectives that they have not been part of. Such participation may be interactive and involve some sort of sharing of decision-making, but tend to happen only after major decisions have already been made by external agencies.
4. Participation for material incentives	People participate by contributing resources (labour in return for food, cash or other incentives). People are not involved in experimenting or learning. When incentives end, people have no interest or option to continue.
3. Participation by consultation	People participate by being consulted or by answering questions. External agents define problems and information gathering processes and control analysis. This process has no room for sharing decision-making power.
2. Passive participation	People participate by being told what has been decided or has already happened. It involves unilateral announcements without taking into account people's responses. The information shared belongs only to external professionals.
1. Manipulative participation	Participation is simply a pretence, with "people's" representatives on official boards but who are unelected and have no power.

Source: Pretty, 1995, p. 1252 © (used by permission of Elsevier)

In analyzing the programs to prevent dengue and the initiatives to control breeding sites, it is apparent that most, if not all, have incorporated participation processes as described in types 1 to 4. Pretty (1995, p. 1253) points out that no lasting effect will occur if participation does not take place as in types 5 to 7. The dengue programs that claimed to be participatory and that failed in the past, most likely sought either passive participation or participation by consultation. Once governments and agencies realized that the expected results were not happening, they shifted to a more inclusive type of participation, possibly type 5 in which participation is encouraged by external agents and decision making is shared but it is still limited. Even in type 5 the continuity and ownership of programs and initiatives by the community are questionable because decisions about the needs, intervention and type of participation are probably not carried out by the community, but by external institutions.

Participation as described in type 7 has been very difficult to achieve and no concrete examples of this type of participation were found in the literature search. There needs to be a high level of community capacity in order for its members to start up initiatives without the intervention of governments or other agencies (Kelly & van Vlaenderen, 1996, p. 1242). Type 7 of participation requires the acquisition of economic funds and technical advice from external sources, while the community still retains control on how resources are used (Pretty, 1995, p. 1252). I argue that if a community is dependent on external economic funding and technical support its ability to become independent and have ownership and control over allocation of funds is very limited unless decisions are shared with funders.

Authors such as Espino et al. (2004, p. 29) disagree as how participation should be achieved. Some argue that participation can only be achieved when community is in full control of the process, such as portrayed in type 7, but others are opposed to this view. Authors such as Carrera (1989 p. 475), Lloyd, Winch, Ortega-Canto, & Kendall (1992 p. 635), and Winch, Kendall, & Gubler (1992, p. 347) point out that it is unrealistic to expect communities to have sole control not only of decisions, but also of resources when they have never done such a thing before. Lloyd et al. (1992, p. 636) suggests that while integrated *Aedes aegypti* control programs require community participation, it is of extreme importance to foster a strong collaboration between the community and the health authorities in order to build skills and capacity in communities so they can become active participants.

The effectiveness of community participation lies in the capacity of the community to define the type of participation its people want to implement according to the needs identified by its members (Winch et al., 1992, p. 342). Equally important is the participation and commitment of local governments in addressing local concerns and in building intersectoral partnerships and collaborations between communities and governments to promote sustainability (Leontsini et al., 1993, p. 270; Toledo et al. 2007, p. 58; Toledo-Romaní, Baly-Gil, Ceballos-Ursula, Boelaert, & Van der Stuyft, 2006, p. 40; Winch et al., 1992, p. 342).

3.1 The Contribution of Intersectoral Action in Building Capacity

The intersectoral collaboration approach was first used and promoted by the World Health Organization through the World Health Assembly at the end of the 1970s,

which aimed at achieving *Health for All by the Year 2000* (Kreisel & von Schirnding, 1998, p. 75) . The term intersectoral has been entrenched within the participatory rhetoric. The Ottawa Charter for Health Promotion⁴ that was adopted during the First International Health Promotion Conference in 1986, called for greater intersectoral collaboration in public health, which meant the creation of community health partnerships and the practicing of holistic approaches to health prevention and health promotion (Axelsson & Axelsson, 2006, p. 76; WHO, 1986, p. 249).

The idea of intersectoral collaboration encourages the participation of more than one sector of society to work towards a common goal (Health Canada, 2000, p. 1). An intersectoral approach to human health is essential in addressing the determinants of health (Hawkes & Ruel, 2006, p. 984). The Population Health Strategy of Health Canada has identified these determinants to be income and social status, education, employment and working conditions, social and physical environments, personal health practices, health services and culture (Health Canada, 2002).

Townson et al (2005, p. 945) recognizes that tackling the problem of vector-borne diseases cannot be seen as the sole responsibility of the health sector. Social, economic and environmental aspects are as important and decisive in controlling communicable illnesses. Therefore, health institutions may seek the collaboration of other sectors of government and society besides health, such as education, environment, housing, non-governmental organizations, municipality, private sector, the community, etc. in order to

⁴ The International Conference on Health Promotion took place from November 17-21, 1986 in Ottawa and it was co-sponsored by the Canadian Public Health Association, Health and Welfare Canada and the World Health Organization.

reduce the proliferation of *Aedes aegypti* and encourage behavioural change in vulnerable people.

It is of paramount importance to promote the integration of resources and collaboration among different sectors because human and financial resources are limited especially in the developing world. Intersectoral collaboration not only serves purposes such as campaigns and programs, but also favours long-term strategies targeted to solve broader issues and influence greater populations (Townson et al., 2005, p. 945; Health Canada, 2000, p.2).

Through intersectoral collaboration it is possible to build capacity at the local government level as well as the community level. But it is important to support the joint work of community and government, and to build consensus in order to achieve long-term outcomes and policy change instead of short-term accomplishments (Sindall, 1997, p. 6; Health Canada, 2000, p. 2).

Lessons learned from the Cuban experience provide evidence that participation in health programs, predominantly in the control of *Aedes aegypti*, has occurred within an interactive participation approach (Pretty's typology 6). Despite of Cuba's authoritarian and centralized regime, local authorities draw in local community knowledge and support and rely on intersectoral collaboration to resolve problems due to severe economic constraints faced by this country (Yassi et al., 2003, p. 64).

As identified by authors such as Bonet et al. (in press), Gubler (2005, p. 222) and Guzman and Kouri (2002, p. 40) Cuba is the only country that has been able to sustainably prevent the proliferation of the mosquito through intersectoral collaboration,

strengthening of local capacities and community involvement in all stages of program implementation. Community participation in health⁵ prevails in Cuba and is fully integrated with the government, neighbourhood committees and mass organizations, which are essential components of community mobilization (De Kadt, 1982, p. 580).

The case study that has been analyzed for the purpose of this document provides evidence on how community participation has contributed to positive results in the prevention of dengue in the District of La Playa, where this community-based program was implemented. Specifically, this case study recognized a direct link between knowledge of dengue and its vector and practices to prevent breeding sites (Sanchez et al., 2005, p. 85). This shows a different outcome than the community-based program that took place in Trinidad and Tobago and that was studied by Rosenbaum et al. (1995, p. 114). In this case, investigators found almost no relationship between the level of awareness about dengue in the community and the actual practices to prevent the propagation of *Aedes aegypti* in their households.

The community-based case study in Cuba shows, however, that the dengue control intervention was not initiated by the community itself, but by external agencies such as health institutes and local government. While community participation has played an important role in this intervention and community knowledge and leadership were taken into account, I argue that the capacity of the community to identify priorities and start social mobilization to prevent a dengue outbreak has been very limited. Therefore,

⁵ Section four provides an extensive discussion about the integrated healthcare system in Cuba and its intersectoral approach.

the potential of this participatory approach to become a sustainable solution for the prevention and control of dengue and its vector remains uncertain.

Furthermore, participatory programs need to be analyzed and evaluated to determine their effectiveness in the long-term. The literature suggests that the community-based programs, including the ones applied in Cuba, have not been assessed beyond one year of completion, which presents problems for continuity once the program ends.

3.2 The Role of Evaluation in Community-based Health Programs

Evaluation is an integral aspect of project cycles including those that are community-based. However, evaluating the effectiveness of community-based interventions has become a real challenge. This is a source of frustration not only for practitioners, but also to policymakers because it has been complicated to prove that community participation strengthens the ability of communities to improve the health of its members (Lasker & Weiss, 2003, p.16).

The literature review shows that most of the dengue control programs have used Rifkin's target-oriented framework and Pretty's participation types 1-4 in the design and implementation of vector-borne control programs. Winch et al (1992, p. 344) argue that in almost all of these initiatives, participation has taken place only at the implementation stage ignoring the significance of participation at the design and evaluation stages, which are also important to ensure sustainability.

Evaluations of target-oriented approaches to participation have quantified results and outcomes, such as the number of people that was reached by the education campaign

or the level of knowledge about *Aedes aegypti*. Usually quantitative methods are used to evaluate this type of intervention. However it is much more difficult to assess the effectiveness of the “empowerment framework” or participation types 5 to 7 because it is more challenging to quantify a process (Toledo et al., 2007, p.61). But as Rifkin, Muller, & Bichmann (1988, p. 933) argue, it is important to assess the effectiveness of this approach in terms of the quality of the participation process: local identification of problems, needs and solutions, community mobilization and engagement, local support, and specific outcomes such as behavioural changes as a result of such processes.

Another limitation is that most of the evaluations related to dengue prevention programs have been conducted during the first year of program implementation and no follow-up strategy has been set up. Therefore, it has been almost impossible to measure the effectiveness of community participation processes over time. Concerns have been raised in terms of the accuracy of the approach and its capacity to be sustainable (Toledo et al., 2007, p. 61).

When using a participatory approach during the planning and implementation stages of a health program, it is important to conduct evaluation strategies that require participation from the affected community (Butterfoss, 2006, p. 329; Yassi et al., 2003, p. 75). Participatory evaluation will help the community address the issues of concern and monitor progress towards common goals contributing to community ownership and continuity of the project (Butterfoss, 2006, p. 329; Cohen & Uphoff, 1980, p. 219). The information gathered through the evaluation process can be used to adapt and make appropriate changes, if necessary, and to sustain the initiative in the future (Butterfoss, 2006, p. 329).

3.3 Barriers to Achieve Participation

Convincing people to participate in a collaborative process with health authorities and other external institutions has proved to be challenging, even if they belong to the same community. Equally difficult is to make sure that those people who began the participatory process remain until the end or even after the project concludes (Lasker & Weiss, 2003, p. 15). Evidence shows that there are several reasons why people are reluctant to participate or are unwilling to make changes even after being involved in participatory interventions.

Knudsen and Slooff (1992, p. 5) recognize that members of some communities may feel they are only transitory residents due to the lack of property titles to their houses or because well-defined social infrastructures are non-existent. This may pose tough obstacles when seeking a community's cooperation.

Community participation may also be affected by the lack of commitment on the government's part to deal with issues such as regular supply of potable water, housing and street repair, waste collection, etc. This is also tied to the perception of people as having no responsibility for vector control at the individual level (Toledo-Romaní et al., 2006, p. 43). Studies conducted in different communities demonstrate that if there is not compromise and negotiation between the communities and the government, no participation is achieved and no long-lasting progress is made (Winch et al., 1992, p. 349).

There is a matter of risk perception as well that has direct influence on people's motivations to participate. Research shows that once the emergency passes and the dengue outbreak is no longer a threat to their health, people tend to disregard the

importance of maintaining preventive measures, such as covering water tanks, disposing garbage or clearing up unused containers. This problem could be averted during the design phase of dengue control programs if the main objectives of the interventions were set to be building community capacity to improve health and life conditions, as opposed to be a merely mosquito control intervention. As Knudsen and Slooff (1992, p. 3) point out, the control of vectors is only a small part of a larger environmental health approach that needs to be taken into account when trying to deal with diseases such as dengue.

Even though some theories promote individual approaches to achieve behavioural changes, scholars such as Melkote (2006, p. 118) have come to realize that change responds to issues that are much more complex and that it must incorporate different aspects of people's lives, for example culture, socio-political structures and socio-economic factors. For example, Jacobson and Chang (2005, p. 4) indicate that people in a community are more willing to accept responsibility and adopt a change in behaviour when they know it is a collective effort that involves them as well as their neighbours.

Dengue control programs in Cuba have overcome some of the barriers to achieving community participation discussed in this section. The political will that exist in Cuba has been essential in sharing responsibilities between local governments and citizens. Cuba's unique social organization and political structure have fostered intersectoral collaboration in vector control initiatives allowing the participation of different sectors, including local governments, environmental and health institutions and the community and have triggered individual and collective action to prevent the spread of diseases such as dengue. The integrated healthcare system in Cuba and its intersectoral approach will be explored in more detail in the following section.

4. AN INTEGRATED HEALTH CARE SYSTEM IN CUBA

The World Health Organization recognizes that popular participation is crucial to achieving healthy communities, in which people take responsibility for their own health and are capable of identifying their own priorities (Feinsilver, 1993 p. 80). In this scenario, Cuba presents a unique case of community participation and local governance within the context of infectious disease prevention.

This chapter explores how Cuba promotes active participation in different social and political spheres including the health care system. The following section presents a brief overview of the country's socio-economic and political background including the creation of the Local Organs of People's Power and the mass organizations that have been essential in the process of achieving popular participation. This section also contains a summary description of the public health care system in Cuba where intersectoral collaboration and community participation take place in an effort to improve health outcomes.

4.1 Country's Overview

When the Cuban Revolution took place in 1959 the government of Fidel Castro strove to have an educated and healthy population to bring progress to the nation and achieve economic and social development. Even though illiteracy rates reached 25 percent and more than 20 percent of the Cuban population was unemployed (Werner,

1983, p. 22), data provided by the World Bank (2007) suggests that in 1960 health indicators such as life expectancy and infant mortality were almost comparable to those in the developed world while the rest of Latin America had lower life expectancy and higher mortality rates.

Table 4 compares health outcomes from 1960 to 2004 in Cuba and the rest of Latin America with high income countries. These figures suggest that in 1960 Cuba had already considerably better health outcomes than any other Latin American and Caribbean country and that life expectancy and mortality rates were almost at the same level as countries in North America or Europe. The Revolutionary regime has continued to provide improving health outcomes at approximately the same rate as the other compared countries (See Table 4).

Table 4 – Health indicators: Cuba, High Income Countries and Latin America & Caribbean 1960-2004

Cuba	1960	1962	1967	1970	1977	1980	1990	1995	2000	2004
Life expectancy at birth (total)	64.2	65.4	68.6	70.0	73.1	73.6	75.0	75.8	76.5	77.0
Mortality rate (infant)*	35.4	39.7	36.8	38.7	24.7	19.6	10.7	9.4	7.2	6.3
Mortality rate (under 5)*	54.0	N/A	N/A	43.8	N/A	24.3	13.2	12.5	9.1	7.4
High income countries	1960	1962	1967	1970	1977	1980	1990	1995	2000	2004
Life expectancy at birth (total)	69.0	69.4	70.5	71.0	73.2	73.8	76.1	76.9	78.2	79.0
Mortality rate (infant)*	35.2	27.5	21.8	22.0	13.2	12.0	8.0	6.2	5.4	5.2
Mortality rate (under 5)*	43.5	32.1	25.7	26.5	15.6	14.5	9.7	7.6	N/A	5.9
Latin America & Caribbean	1960	1962	1967	1970	1977	1980	1990	1995	2000	2004
Life expectancy at birth (total)	56.3	57.3	59.2	60.5	63.5	64.7	68.2	70	71.3	72.3
Mortality rate (infant)*	102.5	N/A	N/A	86.2	N/A	61.6	43.0	35.5	29.6	26.5
Mortality rate (under 5)*	153.9	N/A	N/A	123.4	N/A	82.4	54.0	43.7	35.7	31.4

*per 1,000

Source: World Bank, 2007

In terms of economic development, Cuba remains a low-income country, in which the GDP per capita is \$3,649 (WHO, 2006a) one of the lowest of the American region. The economic scenario in the island has been depressing for a number of years and Cubans have had to go through great personal sacrifices especially in relation to economic development and standard of living. Since 1962, Cubans have lived under a rationing system of consumer goods and have experienced scarcity and deterioration of living conditions such as housing, utilities, purchasing power, etc.

With the collapse of the Communist Block in the 1990s, Cuba went through the “Special Period” which affected living conditions even more. The strict economic blockade imposed by the United States deepened the crisis, which resulted in a period of total austerity and isolation for Cuba (Garfield & Santana, 1997, p. 15). In an effort to fight against the blockade and the crisis, the Cuban government sought tourism development as the only avenue to bring foreign currency to the island to maintain the basic services (Facio, Toro-Morn, & Roschelle, 2004, p. 126; Martin de Holan & Phillips, 1997, p. 782; Peters, 2002, p. 2).

Tourism brought economic hope to Cuba and alleviated some of the most pressing social concerns. But it has also become the main source of disparity in a country where social equality is the paramount principle. Tourism has created a second economy within the Cuban economy, one to which only people involved in this industry have access. This has not only led to social and economic disparities amongst the population, but has also contributed to an increased movement of Cuban professionals to occupations in tourism seeking better living conditions even if that means working in low-skill jobs (Peters, 2002, p. 10; University of BC, 2006b, p. 4).

Even through the “Special Period”, the Cuban government kept its commitment to sustain free and high quality health care for all. Cuba was not only able to maintain the health services that were already in place, but also increased the financial support for the public health care system (Spiegel, 2006; De Vos, 2005, p. 202). This is reflected by the medical developments of Cuba’s health care system during the “Special Period” as indicated in Table 5.

Table 5 – Developments in the Cuban health care system during the Special Period (1989-2000)

Medical Infrastructure	1989	2000
Hospitals	263	284
Policlinics	420	438
Family Doctor Offices	6,000	14,965
Dental Care Clinics	163	166
Research Institutions	11	12
Maternal Homes	148	227
Blood Donor Units	23	27
Elderly Homes	153	210
Disabled Homes	23	29
Medical Personnel	1989	2000
Doctors	38,690	65,873
Family Doctors	N.A.	29,942
Nurses	69,060	84,685
Dentists	N.A.	10,073
Technical Personnel	N.A.	56,521
Other Personnel	N.A.	114,037

Source: Spiegel, 2006; De Vos, 2005, p. 202

Data available from the World Health Report (2006b) shows the percentage of GDP spent on health since 1999. Cuba increased its expenditure every year, from 6.9 percent in 1999 to 7.3 percent in 2003. During the same period the population growth decreased at an annual average rate of 0.4 percent (UNICEF, n.d.), which makes the medical developments mentioned above real health improvements.

An interesting aspect of the Special Period has been food shortage, which has had direct impact on nutrition and health. For example, in terms of per capita food consumption, statistics reveal that Cuban people ate more in the 1950s than they did at the end of the 1990s, from 2,730 to 2,357 calories per day respectively (Smith & Llorens, 1998, p. 250). A survey conducted in 2000 found moderate malnutrition in four percent of all children and severe malnutrition in 0.4 percent of children. The same survey indicated that the most frequent malnutrition problem in Cuba was iron deficiency anemia, which affected at least 23 percent of pregnant women and 46 percent of children from 6 months to 2 years of age (PAHO, 2005a). However, low birthweight rates in newborns have slightly improved between 2001 and 2005 from 5.9% to 5.5% (PAHO, 2005b; Infomed, n.d.).

In terms of per capita expenditures on health, Cuba has one of the lowest rates in the world at \$251 per year⁶, according to data from 2003. Countries such as the United States and Canada spend as much as \$5,711 and \$2,989 respectively per capita every year (WHO, 2006c). Despite this low expenditure compared to other countries where health outcomes are somehow comparable to those in Cuba, this country has managed to have 66,567 doctors (generalists and specialists)⁷ available in the health care system, both rural and urban, with a total doctor: population ratio of 1: 170 or 5.91 doctors per 1,000 people (WHO, 2006d).

⁶ This figure is expressed at international dollar rate, which is a common currency unit that takes into consideration differences in the relative purchasing power of various currencies. It has been calculated using purchasing power parities (PPP) to differentiate price levels between countries (WHO, 2006c).

⁷ In August 2006, the United States announced a new immigration policy that allows Cuban doctors to migrate to the US safely and legally. In the past, the only way that a Cuban citizen –including doctors– could reach the US was through illegal means. This new measure applies to Cuban medical personnel working in other countries. There are more than 20 thousand Cuban doctors currently working in different parts of the world, mainly in Venezuela (Carrillo, 2006, p. 411). The report is not explicit as to what extent Cuban medical credentials will be accredited and Cuban doctors will be able to practice in the US.

4.2 Cuban's Road to Popular Participation

Since its inception, the Revolution encouraged citizens to become involved in every aspect of the country's political life by promoting popular participation. The change in the culture of the population in the past 50 years is the result of a massive political education that every Cuban has experienced through different channels, for example the mass media, schools and universities, family and friends and the overall community (Hernandez & Dilla, 1991, p. 41). Whether at the workplace, in neighbourhood meetings or in popular assemblies, Cubans have become engaged in participatory activities, including several participatory mechanisms widely used to resolve community problems such as "*Bancos de problemas*"⁸ or bank of problems that take place in constituencies formed by several community blocks (University of BC, 2006b, p. 9).

At the beginning of the Revolution, it was necessary to build capacity through institutions that would organize people at a grass-root level. The Committees for the Defense of the Revolution (CDR) appeared in 1962 with the purpose of dissolving any contra-revolutionary activity in the country. Soon they multiplied across the country and today they hold more than 80 percent of the Cuban adult population (Dilla, 2006, p. 38; Hernandez & Dilla, 1991, p. 44; Lopez Vigil, 1997). Recognizing the importance of this and of other mass organizations is crucial in understanding how popular participation in

⁸ The 'bank of problems' serves as an organizational mechanism that incorporates different interest groups such as the municipality and the community. Both groups are committed to discuss and resolve problems raised by the community during popular assemblies held periodically. The contribution of community representatives and government authorities is voluntary. Nevertheless, there is still popular accountability; the representatives have to report back to the community on what issues will be resolved and within what timeframes. Five community blocks comprise one constituency, which has a delegate who represents people from the community at the Popular Council. The Popular Council meets with the municipality and they together constitute a problem bank that represents all of the problems from each constituency. Both the municipality and the popular council provide each other with inputs (University of BC, 2006b, p. 9).

Cuba is structured. Besides their unquestionable political objectives, the CDR have also come to play a very significant role in implementing social and community programs including health care, social activities, education, volunteer work, etc. (De Vos, 2005, p. 191; Hernandez & Dilla, 1991, p. 44). As it will be explained below, the Cuban government has relied on the CDR to encourage and maintain popular participation at all levels.

Paralleled to the CDR, the Federation of Cuban Women (FMC) was also created to promote gender equality in the country and the full participation of women in all aspects of public life. This is another important mass organization that currently has approximately three million female members, which represents more than 50 percent of the female Cuban population. The FMC has also been crucial in health promotion campaigns, literacy programs and the creation of daycare for children, among other activities (Hernandez & Dilla, 1991, p. 44).

Most importantly, the work carried out by the FMC along with government's policies that promote equal opportunities for women has led to significant progress in women's participation in Parliament. For example, after the last general election in 2003, the percentage of female deputies increased from 27.6 to 36 percent. Nowadays women make up 46 percent of the labour force in the civilian public sector, most of them holding leadership positions; and women account for 65 percent of university graduates (United Nations General Assembly, 2006). Another indicator that provides evidence of a greater participation of women in public life is the annual population growth rate. From the 1970s to 1990s, Cuba had an annual population growth rate of 1.1 percent. This figure has been progressively decreasing to reach 0.4 percent in 2005 (UNICEF, n.d.).

In addition to the mass organizations, Cubans participate in different aspects of the social and political life through the Organs of People's Power, that were established in 1976 as a mechanism for citizen participation in the selection of representatives in local government (Roman, 2003, p. 62) at the provincial and municipal levels. Local constituents nominate and elect delegates to represent people at the Municipal Assembly. Delegates must report on the progress of their activities at accountability sessions during neighbourhood meetings that take place twice a year or more if there are extraordinary circumstances.

Since 1988 Popular Councils were created to shorten the distance between the communities and the municipality (Roman, 2003, p. 211). More than 13,000 people serve as delegates in Popular Councils and Municipal Assemblies and the functions of these government bodies involve many ordinary people⁹ in a variety of tasks considered vital to community affairs (Hernandez & Dilla, 1991, p. 52).

However, the issues that are discussed and debated through the mass organizations and the People's Power Assemblies are ones that are not opposed to nor question the status quo. As Hernandez and Dilla (1991, p. 45) point out, the participatory mechanisms utilized in Cuba "do not tell us very much about the quality of this participation, understood as the capacity of the citizen to discuss the making of public policy, to criticize the policy, and to be active in its implementation."

⁹ Even though people are allowed to nominate and choose candidates to represent the public interests in the Popular Councils and Municipal Assemblies, it is important to recognize that Cuba is a one-party system. Even though the Cuban government argues that the Cuban Communist Party does not participate in the electoral process from the institutional point of view, candidates are chosen on the basis of reputation and public profile enjoyed in the neighbourhood they represent. Although candidates are not required to be active party members, their loyalty to the Revolution and support for the regime are important qualities that are taken into consideration at the moment of selecting candidates (Luciak, 2005, p. 245).

The People's Power Assemblies (municipal and provincial) have allowed for some local control over the operation of municipal health facilities. Health authorities have to report not only to the Ministry of Public Health, but also to People's Power health committees at neighbourhood meetings on administrative and operational matters. However, decision-making and planning does not take place in the Assemblies but rather at the Ministry level reducing the capacity of community to influence policy (Feinsilver, 1993, p. 82).

4.3 Public Health in Cuba

The Cuban health care system has built on high levels of health outcomes that the country experienced when the Revolutionary regime took power, as the World Bank indicators (2007) showed in Table 4. The Cuban government maintained those levels and gradually improved health outcomes that have reached both the urban and rural population across the country. At the beginning of the 1960s decade, the government focused on controlling epidemics and treating acute diseases that affected mostly children (Iatidris, 1990, p. 30). While infant mortality deteriorated in the years following the Revolution, after 1971 it has steadily declined.

The current health care system emphasizes prevention, primary care, services in the community and active participation of citizens. Instead of focusing on the illness, the health care system centers its attention in wellness (Iatidris, 1990, p. 29; Werner, 1983, p. 22) incorporating different aspects of life that are determinants of good health, such as nutrition, environment, education, employment, etc.

The Ministry of Public Health was appointed the sole entity in charge of providing health services. All hospitals, clinics and health centres were nationalized producing a heavily centralized health system. At the same time, major attention was placed in preventive measures at all levels of the health care system and priority was given to maternal-child health (Iatidris, 1990, p. 30).

The Cuban health care system claims to rely on community participation not only in its planning and selection of priorities, but also in the promotion of health and wellbeing. The preventive campaigns have been implemented with the assistance of community organizations such as the Committees for the Defense of the Revolution (CDR) and the Federation of Cuban Women (FMC).

The changing medical needs of the population over the years prompted the government to change the health programs to meet the challenges (Feinsilver, 1993, p. 47). For example, the health centres that were spread out around the country became the policlinics in the mid 1960s as part of the primary care system within a system that includes secondary and tertiary care as it will be explained below. Eighty percent of health problems in Cuba are handled at the primary health care stage (Green, 2003, p. 106).

The policlinics are run by a team of primary care specialists, for example pediatricians, gynecologists, nurses, etc. to carry out vaccination programs, sanitation activities, school health services, and to treat cases that did not need specialization. The policlinics have provided services to a predetermined population (according to age and location) of 25,000 to 30,000 people in a given area (Iatridis, 1990, p. 31).

In 1970s the “medicine in the community” program was launched. This program provided preventive and curative health care through an integrated national system with the active participation of the communities. The idea behind this program was to offer the polyclinic’s services in the neighbourhoods, which meant treating patients not only in the polyclinics, but also visiting them in their own environments such as homes, workplace, schools, etc. This was seen as the ultimate goal in achieving a holistic approach to health care in which patients are treated as bio-psycho-social beings (Feinsilver, 1993, p. 37).

But in the 1980s after evaluating the “medicine to the community” program and realizing that it was not working as efficiently as health authorities had anticipated, a new system was introduced: the “family doctor”, functioning in mini-polyclinics or *consultorios* and aiming to serve smaller local units usually where population density was high and treating approximately 500 to 700 people (Werner, 1983, p. 25). This program served people in their own community in rural and urban areas alike. Teams of family doctors (a doctor and a nurse) work in *consultorios* and typically live in the community where they serve. The doctor’s task is to investigate and monitor the health of the whole population of which they are in charge, not just the sick people. They provide care to an average of 150 families whom they visit on a regular basis for prevention and control (Cooper, Kennelly, & Orduñez-García, 2006, p. 818). Doctors usually see people in the morning and visit patients in their homes in the afternoons.

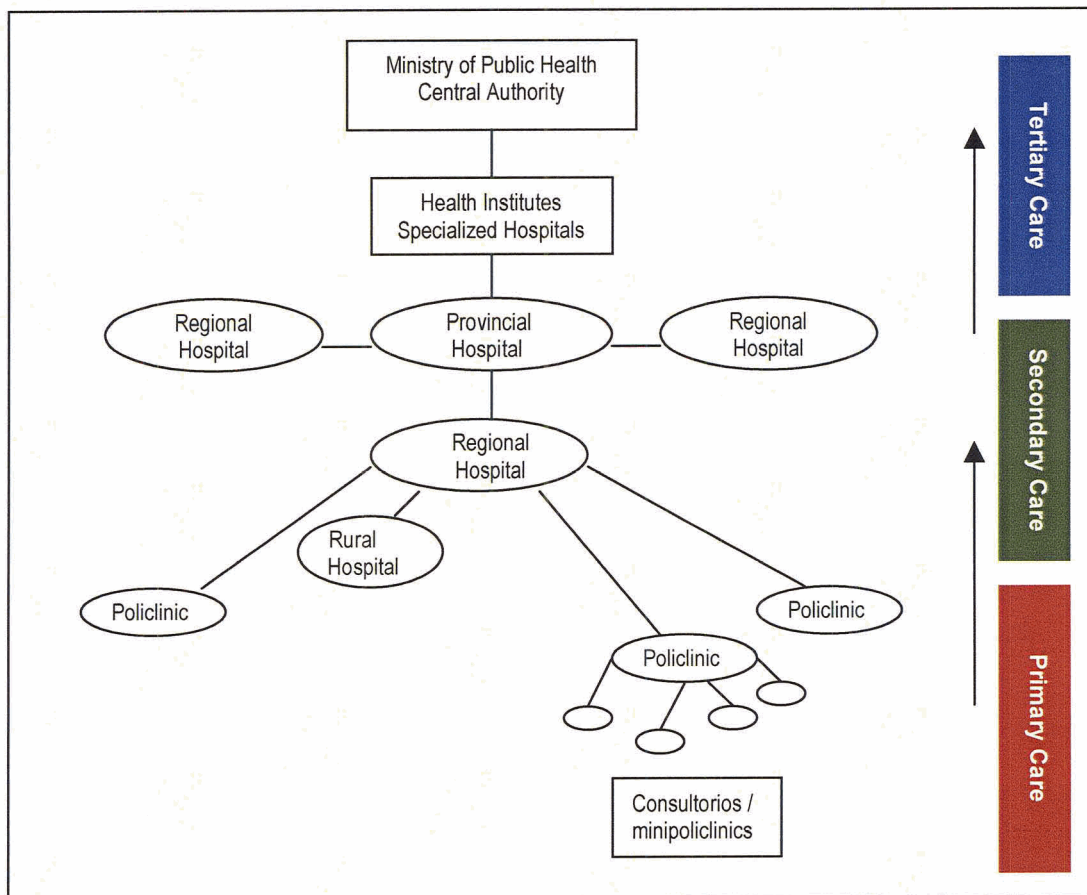
Feinsilver (1993, p. 45) reports that preliminary results of the family doctor program indicate that medical costs have been reduced through decreased hospitalization and emergency room use and more effective prevention. Some analysts believe that the family doctor program is effective and justifiable in the rural areas, but not so much in

the urban regions where there is already a well-established health care system (Ibid, p.46). The family doctor program that started as a pilot project back in the 1980s has been fully implemented in the 1990s and is currently maintained by the government.

Secondary or specialty care is provided at the municipal and provincial levels through small hospitals that offer certain type of specialized treatment. These hospitals reach anywhere from 250,000 to one million people depending on the location. More than 90 percent of the Cuban population lives within one hour's travel from a polyclinic (Werner, 1983, p. 25). In rural areas where access to regional hospitals may be difficult, the polyclinics are replaced by what is called a rural hospital, which deals not only with preventive community medicine, but also treats patients for more complicated illnesses.

The tertiary care system takes place at the national level and comprises health institutes and super specialized hospital centres where medical research is undertaken along with specialized care. In the three levels of the health care system, the mandate is not only treatment, but most of all disease prevention (Spiegel, 2006). The structure of this integrated and centralized three-level health care system is illustrated in Figure 2.

Figure 2 – Organization of Cuba’s integrated health care system



Source: Adapted from Werner, 1983, p. 24; Itatidris, 1990, p. 31

Popular participation in health education and prevention has been an essential part of this centralized system. According to Feinsilver (1993, p. 64) popular participation has allowed individuals and communities to learn self-reliance and problem-solving techniques as well as accurate information in order to make smart decisions. People are also encouraged to take care of their own health and their neighbours by recognizing symptoms or by taking preventive measures that have been learned through community meetings or the local media.

Werner (1983, p. 34) argues that this highly centralized, state-run and state-control health care system may be inefficient. And even though the government claims that the system is participatory and that citizens can influence decision making and feedback is welcomed, Werner questions the validity of this statement since it is the government through the Ministry of Public Health that makes decisions of what campaigns should be implemented and how services should run.

Analysts criticized the family doctor program, for example, alleging that it promotes patient dependency and that it is not cost-effective if real dollars are allocated to having thousands of trained doctors treating trivial problems (Werner, 1983, p. 32). Werner and others have also questioned the role of the mass organizations, such as the CDR and the FMC, as well as the open access that government has to people's homes through the health care system stating that it may be a form of social control. These organizations and the government itself are becoming involved in people's affairs influencing their ideology and feelings towards the government and the revolution¹⁰.

Despite the high degree of participation that takes place in Cuba, the political system continues to be hierarchical, centralized and controlled by the head of the State. However, as it will be described in the following section, the Cuban government does take people's views and priorities into consideration when designing policy to some extent and local government draws in local community knowledge and support to implement health strategies. That is why the Pan-American Health Organization regards

¹⁰ Even though the intent of this paper is not to conduct a political analysis of the Cuban health system, it is important to recognize that politics play a major role in all aspects of Cuban life including health. A more thorough analysis of the efficiency of the system in achieving its goals in terms of community participation and diseases prevention and the relationship with the Cuban political system will be provided in the case study section.

Cuba as the only country that has put real emphasis on health prevention and one of the few that have achieved community participation at a national level beyond the implementation stage of health projects (Feinsilver, 1993, p. 81).

4.3.1 Disease Control

The Cuban Ministry of Public Health has been very successful in eradicating certain illnesses that are common in the developing world such as polio, malaria, tetanus, rubella and diphtheria through massive vaccination campaigns that started in 1959. The reduction of infectious diseases has also been successful through national epidemiology programs that monitor the population to detect and treat communicable and non-communicable diseases and to prevent outbreaks. This has had a direct impact on life expectancy rates in Cuba (Erickson, Llord & Wolf, 2006, p. 21).

Cuba's strategy is based on intersectoral collaboration, which promotes the participation of different actors such as the health authorities, family doctors, mass organizations, popular councils and the community¹¹.

Schulz, Krieger, & Galea (2002, p. 290) recognizes the importance of equal participation of residents, community-based organizations, government and service agencies in addressing the social determinants of health and developing preventive measures. The combination of high levels of community participation, the universal access to primary care and its public health approach have made Cuban campaigns against epidemic infectious diseases very successful (Cooper et al., 2006, p. 821).

¹¹ For a more extensive explanation of intersectoral collaboration, review section 3.1 The Contribution of Intersectoral Action in Building Capacity.

Dengue control is a good example of a campaign against epidemic diseases that has utilized extensive community-based surveillance and participation achieving positive results in terms of knowledge, attitudes and practices towards the disease and its vector. When the national dengue outbreak occurred in 1981¹² Cuba organized a rigorous intersectoral environmental surveillance program, which combined the capabilities of the primary health care system, community-based medicine, epidemiology and neighbourhood participation (Whiteford & Hill, 2005, p. 226).

The integrated surveillance system, which was applied later in several municipalities of Havana from 2000 to 2002 to effectively control a dengue epidemic, has three main subsystems and builds on existing strengths: epidemiological clinical surveillance (collection and analysis of data, detection and isolation of cases); entomological surveillance (active surveillance in areas of infestation); and environmental surveillance (identification and stratification of risks) (Bonet et al., in press). In addition, development and close monitoring of community participation has been crucial to the program's success.

Surveillance systems not only need to be implemented when there is an epidemic outbreak. Cuba has been a pioneer in promoting passive surveillance programs even when dengue fever was eradicated and did not present a threat to Cuban population and when in other countries had been reduced or terminated.

In Cuba, for example, a team of inspectors known as *campañistas* or *operarios* is assigned to a specific number of house blocks. They check houses for the presence of

¹² This outbreak was very significant because it happened after Cuba had eradicated the disease and it was the first time that cases of dengue hemorrhagic fever were diagnosed in the island and in the Americas.

breeding sites and for unhygienic conditions. Although during dengue outbreaks, the inspectors visit homes twice a month, during passive surveillance the visits can be more sporadic. The information obtained by *operarios* is then submitted to the *Jefes de Brigada* (brigade chiefs) who are in charge of gathering the information and appropriately feeding the surveillance system (University of BC, 2006a, p. 3).

One of the main limitations of the surveillance system in Cuba, however, seems to be the lack of computerized systems that prevents a timely processing of the information gathered by the inspectors (University of BC, 2006a, p. 10), rendering the inspection process and therefore the control and prevention programs less effective.

5. ANALYSIS OF A COMMUNITY-BASED DENGUE CONTROL PROGRAM: A CASE STUDY

The following section analyzes a case study of a participatory community approach for the prevention of *Aedes aegypti* and control of dengue in a district of Havana City. The objective is to analyze the effectiveness of the Cuban organizational system in terms of community participation and intersectoral collaboration to address vector-borne diseases. The intervention obtained positive results in improving knowledge and changing behaviour and practices towards dengue in the short term.

In this case study, participation was understood as the empowerment of the community through the development of skills and abilities of the people to resolve their health problems (Sanchez, Perez, Cruz, Silva, Boelaert, & Van der Stuyft, 2004, p.23). The analysis indicates that there was a high level of participation at the community level where the study took place reflected in at least 90 percent of community leaders attending intersectoral meetings and debates, children participating in education and cultural activities and senior citizens taking part in drama sessions related to dengue prevention (Sanchez et al., 2005, p. 85). However, participation occurred mainly as a contribution to the initiatives that were started at the top level by health institutions and the local government.

The study unveils two important aspects that may influence the effectiveness of the participatory approach: the lack of community capacity actually to initiate a dengue control intervention locally, and the failure to evaluate results in the long-term.

5.1 A Community-based Intersectoral Initiative for the Control and Prevention of Dengue in Cuba¹³

As a result of the epidemics of dengue fever and dengue hemorrhagic fever that occurred in the 1980s, Cuban authorities began to promote participatory approaches to control the disease and the proliferation of its main vector. Cuba's strategies of dengue prevention shifted to intersectoral collaboration in which the participation of different sectors, such as the Ministry of Health, the dengue control personnel, the local government, the school boards, the Committees for the Defense of the Revolution, the Popular Councils, and the community, was crucial to the achievement of positive results.

In studies conducted in different parts of the country and in different time periods, Sánchez and colleagues (2005, p. 82) found that the introduction of participatory methods and techniques actually changed the way intersectoral management was carried out. This led to an improvement in knowledge, attitudes and practices related to dengue and *Aedes aegypti*.

The following case study presents a summary of an intervention program conducted in the Playa District for a period of one year from September 1999 to August 2000. This intervention first documented the understanding of participation seen from the community's perspective. These results were used as the basis for designing participatory

¹³ Sanchez, L., Perez, D., Cruz, G., Silva, L. C., Boelaert, M., Van der Stuyft, P. (2004). Participación comunitaria en el control de *Aedes aegypti*: opiniones de la población en un municipio de La Habana, Cuba. *Revista Panamericana de Salud Pública*, 15(1), 19-25.

strategies for controlling *Aedes aegypti*, in which participation and social mobilization were analyzed and the effects on community's knowledge, attitudes and practices towards dengue and its vector were evaluated.

5.1.1 Study Hypothesis

Effective community-based vector control could be achieved by changing the concept of the existing intersectoral management from a technocratic model¹⁴ towards a participatory approach that involves the community in all phases of planning and implementation (Sanchez et al., 2005, p. 83).

5.1.2 Study Methodology

Many studies have been conducted to address obstacles that health authorities and local governments face to achieve community participation in specific health programs. However, very little research has been undertaken to discover the community's perceptions, interests and capacities that directly influence their motivation to participate in health related programs.

In order to address this research gap, Sanchez and colleagues (2004, p. 20) conducted the study in the district of La Playa in Havana City. As noted earlier, the purpose of this study was to examine people's perception of community participation, the priorities and the problems related to *Aedes aegypti* control, as well as the existing organizational structures and the main training needs. The findings helped determine the participatory strategy that was most appropriate for controlling the proliferation of *Aedes*

¹⁴ Technocratic intersectoral management could be defined as collaboration between professional experts from several sectors (agriculture, education, health, local government, etc.) whose objective is to achieve a common purpose such as the prevention of dengue epidemics or the control of *Aedes aegypti* in households.

aegypti in this area. A series of quantitative and qualitative methods were used: interviews with key informants from the nine health areas of La Playa district and general surveys applied to a population sample.

Once the results were obtained, members of the Health Council of La Playa District in partnership with family doctors, vector control personnel and the community developed an intersectoral plan for dengue prevention focused on source reduction (elimination of larval habitats: removing unused containers, covering water tanks, etc.). Knowledge, attitudes and practices related to dengue and entomological indices were analyzed in the areas of study before and after the one-year intervention period. The Popular Councils of La Playa were the main intersectoral team that assisted with the implementation of this intervention.

5.1.3 Study Site (September/October 1999)

The study was conducted in the District of La Playa in the neighbourhood of Marianao, located in the northwest part of Havana City. It is an urban setting as well as an important tourist attraction. It has a population of 176,700 inhabitants and 293 mini-policlinics or *consultorios* for primary care attention. As is the case in many localities in Havana, La Playa has a mixed socio-economic population with residential buildings as well as unsanitary housing where population density is high and water supply and waste collection are infrequent, leading to unhygienic conditions and the propagation of vectors such as *Aedes aegypti* (Sanchez et al., 2004, p. 20).

This municipality experienced dengue epidemics in 1977 and 1981 and since 1992 foci of *Aedes Aegypti* have persisted. As of 1998, La Playa scored one of the highest

larval infestation levels among the 15 constituencies that currently exist in Havana City (Sanchez et al., 2004, p. 20).

The main breeding sites where *Aedes aegypti* larva was identified were artificial containers (bottles, cans, flower vases, etc.), water storage tanks inside homes and old tires (Sanchez et al., 2004, p. 21).

5.1.4 Community's Understanding of Participation

The findings of this study in terms of community's understanding of participation reveal that even though the participants recognized some sort of responsibility for their own health, the majority of people still viewed participation as a mere collaboration and support of initiatives generated by health authorities at the government level. People did not feel part of the decision-making process (Sanchez et al., 2004, p. 23).

Participants thought that citizens were responsible for taking part in the development of their community as part of the participatory process. Most of the people interviewed believed that participation should be a volunteered activity without remuneration (Sanchez et al., 2004, p. 23).

There were favourable responses in terms of the participation and involvement of mass organizations and community leaders in activities related to the elimination of mosquito breeding sites (Sanchez et al., 2004, p. 24), however, the community thought it was essential to encourage not only collective, but also individual actions in order to promote community participation. Emphasizing individual responsibility was seen as a top priority to stimulate the eradication of mosquito breeding sites in the community (Ibid).

People thought that it was necessary to present the benefits of participation in the planning and implementation stages for the well-being of the whole community. Those benefits have to be clear and understood by the community sooner rather than later (Sanchez et al., 2004, p. 24).

5.2 A Community-based Intersectoral Plan for Dengue Prevention through Source Reduction¹⁵

Investigators from the Instituto de Medicina Tropical 'Pedro Kouri' (IPK) approached the Consejo Popular of La Playa to work together with the Health Council and the community of the district in dengue prevention activities. The initial work focused on team building with the support of social scientists that facilitated participatory sessions in which all team members were able to exchange ideas on how to motivate the community and increase the risk perception of dengue (Sanchez et al., 2005, p. 84).

The intersectoral group (Health Council, health authorities from IPK, vector control personnel and community leaders from the Consejo Popular of La Playa) was trained to design and implement a communication and social mobilization strategy for the control of *Aedes aegypti*. The campaign focused on source reduction. Medical doctors, biologists and geographers from IPK as well as social communication and education experts trained family doctors in the area on dengue and vector control and on communication and social mobilization techniques. Family doctors trained health promoters on these subjects (Sanchez et al., 2005, p. 84).

¹⁵ Sanchez, L., Perez, D., Perez, T., Sosa, T., Cruz, G., Kouri, G., et al. (2005). Intersectoral coordination in *Aedes aegypti* control. A pilot project in Havana City, Cuba. *Tropical Medicine and International Health*, 10(1), 82-91.

Sample surveys were conducted before the start and after one year of intervention to document knowledge, attitudes and practices in relation to dengue, its transmission and prevention. Data collected through the entomological surveillance system (a regular Cuban *Aedes aegypti* eradication program¹⁶) were used to determine infested households (Sanchez et al., 2005, p. 84).

5.2.1 Findings – A Community-based Intersectoral Plan for Dengue Prevention through Source Reduction

Community participation was very high; at least 90 percent of community leaders (elected or appointed by community members) attended intersectoral meetings with the Health Council. Leaders encouraged members of the community, especially children and elder people, to participate in social mobilization activities such as cultural and artistic presentations that focused on messages that motivated people to eliminate unused containers or cover up water-holding recipients (Sanchez et al., 2005, p. 85).

A number of communication and social mobilization techniques were developed to involve the community: puppet shows, drawing competitions, community debates, and drama sessions that were all planned and performed by members of the community itself (Sanchez et al., 2005, p. 85). Community leaders were very active in advising and adapting information and messages and helping in the establishment of networks for communication and social mobilization at the local level, although not specific number of

¹⁶ The entomological surveillance in Cuba consists of a number of inspectors also known as *campañistas* who examine homes for presence of breeding sites and deplorable hygienic conditions. Visits can take place twice a month during active outbreaks of dengue and less frequent (sometimes once every six months) during passive surveillance. The *campañistas* identify mosquito larvae in water containers, classify each container and the unused ones are destroyed. Samples of *Aedes aegypti* foci are sent to the municipal laboratory for identification. The appropriate information is fed into the surveillance system that is available nationwide. Quality control inspectors (mostly women) inspect the work of *campañistas* regularly, approximately one-third of the inspected houses. More information about the Cuban surveillance system can be found in Section 4 – An Integrated Health Care System in Cuba.

members of the community who participated in these activities were found in the literature (Ibid, p. 89).

Community organizations led various activities that contributed to the knowledge, attitudes and practices towards dengue and its vector in the community. For example, the community was involved in sanitation activities and collection of waste and recyclable material, such as identification of high risk places, the coordination of collective clean up of homes to eliminate unused containers, and constant dissemination of information related to dengue and its vectors using communication and social mobilization techniques described earlier. People in the community were not only receiving information from health authorities through pamphlets or public service announcements broadcast by the mass media, as other community-based projects have typically operated, but they were involved in activities that facilitated learning and provoked actual change in behaviour. Other sectors such as government, health council, education board, etc. were also very active in providing information to the community as well as resources to conduct important sanitation activities (Sanchez et al., 2005, p.85).

Table 6 summarizes the contribution of different sectors in the dengue prevention plan (Sanchez et al., 2005, p. 87).

Changes in knowledge and practices after the intervention were surprising. Knowledge increased particularly in relation to breeding sites and practices improved considerably especially for eliminating unused containers. This is evidenced by positive responses of knowledge and understanding of dengue and its vectors from the surveys distributed to participants in the community and by the reduction of the house and container indexes in the inspected households (Sanchez et al., 2005, p. 85).

Table 6 – Contribution of the different sectors in the dengue prevention plan in the intervention area

Activities	Government	Public services	Educational sector	Cultural sector	Health sector	Community organ.	External experts
SANITATION ACTIVITIES							
Identification of high-risk places		X			X	X	
Planning and coordination	X	X	X	X	X	X	X
Dissemination			X	X	X	X	
Social mobilization	X				X	X	
Providing resources	X	X					
COLLECTION OF RECYCLABLE MATERIALS							
Planning and coordination			X			X	
Execution of activities			X			X	
SOCIAL COMMUNICATION STRATEGY							
Identification of messages and target groups			X	X	X	X	X
Planning and coordination	X	X	X	X	X	X	X
Implementation	X		X	X	X	X	
Providing resources			X	X	X		X

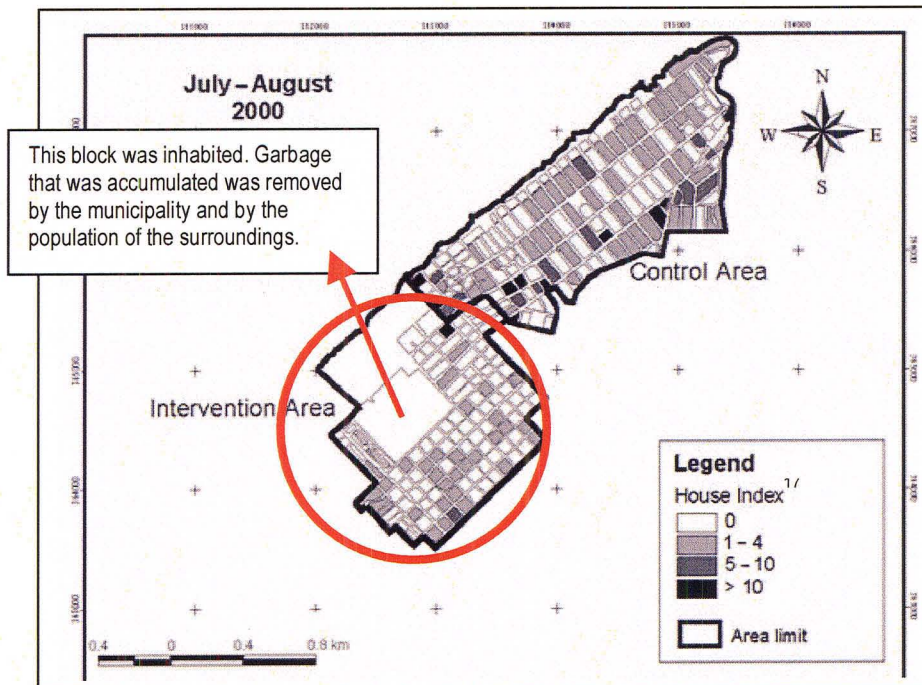
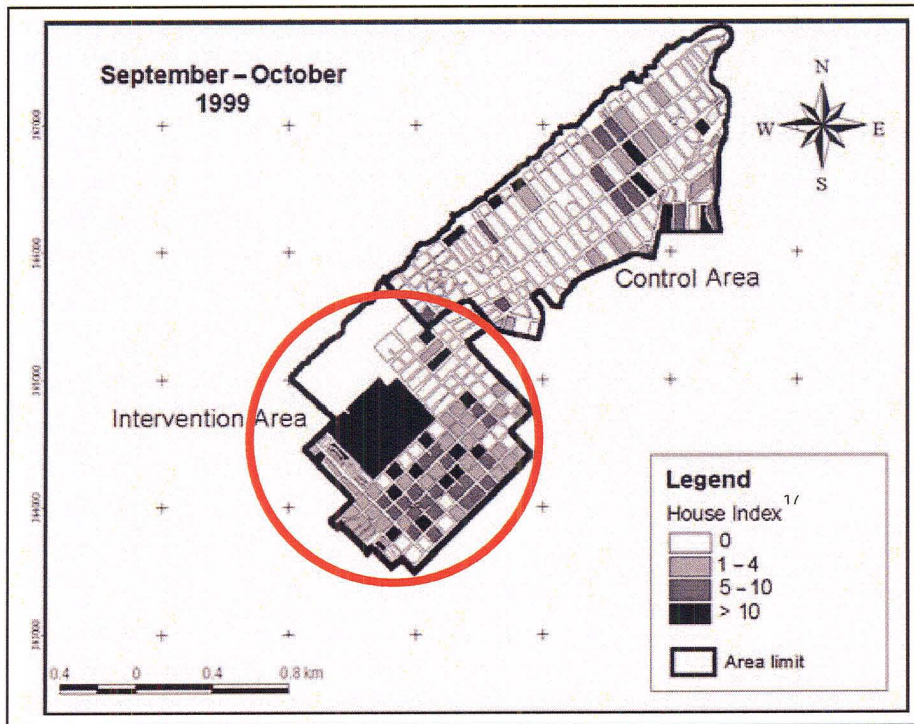
Source: Sanchez et al., 2005, p. 85 © (used by permission of Blackwell Publishing)

The House Index¹⁷ in the community dropped from 3.7 to 0.61 percent after the intervention. At the end of the study, the percentage of house blocks without infestation of *Aedes aegypti* increased from 44.5 to 74 percent. The Container Index¹⁸ was also reduced significantly (from 27 to 7 percent) after the community-based intersectoral plan was introduced. Figure 3 illustrates the decline in House Index after the plan was implemented (Sanchez et al., 2005, p. 86).

¹⁷ House Index: number of houses with at least one container with *Aedes aegypti* larvae.

¹⁸ Container Index: number of containers with *Aedes aegypti* larvae.

Figure 3 – *Aedes aegypti* house indices before and after the intervention



Source: Sanchez et al. 2005, p. 87 © (used by permission of Blackwell Publishing)

Political will was an important element of this initiative. The local government – through the Health Council and the family doctor network- was an active participant at all levels and stages; it provided financial support and ensured that unsanitary conditions in the area of study were addressed (Sanchez et al. 2005, p. 89).

5.3 Discussion

The introduction of participatory techniques and methods was essential to encourage the involvement and participation not only of the community, but also of other important actors such as the local government, family doctor networks and the vector control personnel. Family doctors and health promoters were given specific training about vector control and the community was motivated to exchange local knowledge and information and to become active participants. The study indicates that the involvement of all these sectors in the design and implementation of strategies to control dengue contributed to achieving social mobilization.

The Cuban case study shows that the participation of leaders and individuals in community meetings and debates and in specific communication and education activities triggered not only collective actions such as clean up of common spaces in the neighbourhood, but also influenced individual behavioural change, for example the elimination of unused containers inside and around households. These positive outcomes were complemented by the participation of the local government through waste collection improvement and institutional support that also had tremendous impacts on the reduction of breeding sites and decreasing of number of houses infested with *Aedes aegypti*.

Others studies conducted in different parts of the world to determine the relationship between knowledge of dengue and practice to prevent potential breeding sites have reported fewer positive results than the case study in Cuba. In the study conducted by Rosenbaum et al. (1995, p. 114) in Trinidad and Tobago it was found that there was a high level of awareness about dengue in some parts of the community but very little understanding of the health risks and consequences of the disease. Members of the community who had experienced dengue fever in the past were inclined to maintain water-holding containers in their households just as much as those people who had never experienced the illness before (Ibid).

The community in Trinidad and Tobago reported that most of the information and education about insect prevention came from the Insect Vector Control Division of the Ministry of Health (Rosenbaum et al., 1995, p. 114) during periodic visits of vector-control personnel. However, the study reported that people felt the information that was given to them was not enough (Ibid). This community-based program focused on information and education about dengue, but it did not provide evidence of community engagement in social mobilization activities to promote behavioural change. Sanchez et al. (2005, p. 89) recognize that knowledge alone does not produce individual behaviour change and that social influences at different levels are necessary, for example mobilizing social networks and organizations, engaging the communities in vector-control activities, and making government accountable for public health policy.

A review of studies on knowledge, beliefs and practices concerning dengue and dengue prevention in Brazil, Colombia, Mexico, Dominican Republic, Trinidad and Tobago and Thailand (Claro, Tomassini, & Rosa, 2004, p. 1454) reveals that the

community-based programs analyzed have concentrated on traditional information campaigns that have not been successful in changing attitudes and behaviours of the population. Such strategies have not taken into account the knowledge that already existed in the community, have not discussed community's priorities and have not engaged the affected population in the planning of the education and information programs.

Research indicates that members of the community in the district of La Playa developed communication and education skills and were very active in using those skills to initiate social mobilization to clean up common spaces and to change behaviours at the individual levels. Contrary to what has been reported about other interventions (Rosenbaum et al., 1995, p. 114; Claro et al., 2004, p. 1455), the case study in Cuba presented in this document shows that the participatory approach – in which members of the community were involved in interactive learning and in activities bearing on the eradication of the vector- was successful in increasing knowledge about *Aedes aegypti* and in translating such knowledge into an actual reduction of potential breeding sites, as shown in the lowering of the House Index levels.

The political will that exists in Cuba to address and solve health matters is very significant and it goes beyond the use of participatory techniques. The Cuban healthcare system itself is crucial in determining the prevalence of different diseases and implementing rapid responses to prevent crises. The network of family doctors who visit patients and are aware of the overall health in the community enables the identification of risks and taking of appropriate measures for avoiding outbreaks of dengue. Despite its challenges, the entomological surveillance system is remarkable during the dengue

outbreak seasons as well as during periods when cases of dengue are not reported. This is because the surveillance system has the capacity to inform health authorities about household conditions, breeding sites and potential dengue outbursts.

The Cuban case study, however, shows some limitations. One of the main obstacles observed was dealing with different perceptions of participation not only at the community level, but also among the other actors that were also involved in the participatory study. Transferring of responsibility for control and prevention to health authorities is not uncommon and it is not different in the case study presented here. Perhaps the main difference in the Cuban case study is that community members recognized that the participation of community organizations and leaders in activities that help reduce breeding sites was at least of some importance. This is reflected in the participation level of community leaders in planning meetings that reached 90 percent, as it has been reported by the authors of the study (Sanchez et al., 2005, p. 85).

One of the shortcomings of the findings in terms of community's understanding of participation is the need to have immediate tangible benefits. This affects the sustainability and long-term duration of appropriate knowledge, attitudes and practices towards mosquito control. Therefore it becomes a challenge to predict if a community will maintain certain behaviour that will help reduce the proliferation of mosquitoes in their household beyond the intervention period.

In terms of evaluation, the Cuban case study did not differ from others because the evaluation of the community-based intersectoral study reported on findings that occurred during one year of implementation, which is still too short a period to determine sustainability. One of the criticisms the community-based programs receive is the lack of

evaluation of knowledge, attitudes and practices over the long-term. From the participatory perspective, this case study fails to show the sustainability of the participatory strategies because no evaluation has been conducted years subsequent to the intervention.

Even though the current case study began by exploring the understanding of community participation from a community's perspective, it is unclear how these findings influenced the decision-making process and the selection of strategies that were used for the community-based intersectoral intervention. It is also interesting to observe that the health institute in Havana initiated contact with the community to design a dengue prevention project, rather than the other way around. Despite what the literature has indicated about community-based participatory approaches in Cuba, there are limitations in terms of actual examples that show bottom-up initiatives.

It is important to point out that due to the positive results obtained after this pilot project, similar efforts were replicated in other communities of Havana City and other parts of the country using community-based intersectoral participation as a strategy to control the proliferation of the mosquito and to prevent dengue. The 2001-2002 dengue epidemic was the last one that occurred in Cuba and evidence shows that after participatory intersectoral initiatives have taken place in the island, the house index has been kept to less than 0.1 percent and that no cases of dengue fever or dengue hemorrhagic fever have been reported since the last outbreak (Bonet et al., in press).

This case study has provided some evidence that local community capacity has a role to play in the translation of knowledge into action and practices that improve the health and environmental conditions at the individual and collective levels. But it is

necessary to engage the community at the planning stage of a dengue control program as well as to promote social mobilization strategies that involve members of the community in project activities.

However, the lack of evaluation of community-based dengue control programs over time – and the Cuban case study is not the exception- has confirmed the challenge of being able to determine whether these approaches can indeed sustain community participation in preventing vector-borne diseases, such as dengue, in the long term.

6. CONCLUSIONS

Vector-borne diseases, such as dengue, cannot be seen as the exclusive responsibility of the health sector. Addressing the social, economic and environmental determinants of health is paramount and decisive in the control and prevention of infectious diseases. Traditional programs that focused on mosquito larval control and the use of chemicals failed to address such determinants and were unable to avoid future dengue outbreaks. New approaches that foster integration of resources and collaboration among different sectors, including the community, have been viewed as sustainable mechanisms to control vector breeding sites and to prevent new dengue epidemics.

This paper aimed to identify the role of community participation in the control and prevention of dengue within an intersectoral collaboration framework and to assess the effectiveness of these new participatory approaches in addressing the challenges presented by vector-borne diseases. In particular, I have examined a community-based intersectoral initiative that took place in the district of La Playa in Havana, Cuba from 1999 to 2000. La Playa has had several dengue epidemics in the past and was considered the municipality with the highest larval infestation levels in Havana City.

I have analyzed the organizational system of the community-based initiative and the effectiveness of the participatory approach using Pretty's (1995, p. 1252) Typology of Participation.

6.1 Findings

The Typology of Participation (Pretty 1995, p. 1252) identifies seven types of participation that range between passive (types 1-4) and active community engagement (types 5-7). From the literature that was examined for this purpose, it was found that most of the cases reviewed fell under types 1 to 4. Participation was imposed on the community where the program was implemented or it was seen as a consultation about decisions that were already made by external agents or as material incentives that attracted people in the short term.

It is essential to recognize that each type of participation described in this model cannot be seen in isolation of the socio-political contexts where the community-based programs take place and therefore several types of participation can be applied to a particular community-based intervention. The analysis of this case study shows the existence of overlapping and integration between different types of participation.

For example, the Cuban experience may be categorized as Functional Participation (type 5) or Interactive Participation (type 6) or a combination of both because participation was conceived mainly as a means to achieve a specific project goal: to avoid a dengue outbreak in this district. The community-based initiative in Cuba had important components of Interactive Participation such as strengthening of local institutions, joint analysis and some degree of local decision-making. However, participation was initiated by external agencies and the objectives were predetermined, which are characteristics described as 'Functional Participation.' As well, the case study did not provide evidence of the community taking control over financial decisions such as budget allocation, which corresponds to the Interactive Participation level.

None of the cases examined, including the one in Cuba, presented features of Self-mobilization (type 7). Even though the process involved interdisciplinary and participatory methodologies and a high degree of participation of the community in the district of La Playa was observed, the community participated in planning and implementation but only to a certain degree. Participation occurred as a contribution to initiatives that were generated by other actors outside of the community, such as the local government, research institutions and health councils. This indicates a low level of community capacity to initiate social mobilization and lead change without the support of external agents.

Emphasizing individual responsibility to stimulate change was seen as a top priority by people involved in the study. However, it was found that collective action (such as clean up of common spaces, waste reduction) was the main catalyst that triggered individual behavioural change. Pressure and exemplary actions from specific members of the community - such as leaders- brought about cooperation within the population.

The knowledge that existed in the community or that was acquired during the intervention period was translated into positive attitudes and practices that contributed to the reduction of contaminated sources such as open water containers, water tanks, tires etc. It was observed that the intervention of external agents, for example health institutes and local government, was essential to help the community gain positive attitudes and practices. The Cuban experience points out that collective action can be achieved by fostering strong collaboration between the community and the local governments while working towards common goals.

While there is an important role for community participation in achieving positive results in the control and prevention of dengue, it remains questionable if the participatory approach could be a sustainable solution to prevent future dengue outbreaks. The literature reveals that all the community-based programs, including the ones implemented in Cuba, have only been assessed after one year of project conclusion, which shows limited evidence of the continuity of adequate attitudes and practices in the long term. The lack of evaluation over time of community-based dengue control programs is an important gap in the literature that could be addressed in future research.

Evidence shows that information and knowledge are not sufficient to achieve and sustain behavioural change among the populations at risk of acquiring dengue. Despite the number of studies conducted that looked at knowledge, attitudes and practices related to dengue and its vector, very little research has been undertaken in terms of frameworks to understand change, aspects of life that trigger change and mechanisms to measure change.

Even though the subject of behavioural change and the question of how change occurs are beyond the scope of this project, its relevance to dengue control and prevention has become obvious. Future research could potentially concentrate on aspects of human behaviour and issues that provoke permanent change.

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